

REMARKS

Claims 28 to 41 are all the claims pending in the application, prior to the present Amendment.

Applicant has added new claims 42 to 49. Claims 42, 43, 45 and 46 find support in original claims 3 and 4. Claims 44 and 47 find support at page 16, lines 25 to 28 of the specification. Claims 48 and 49 find support in the specification at, for example, page 13, lines 16 to 18.

Claims 30, 33, 35-39 and 40 have been rejected under the second paragraph of 35 U.S.C. §112, as indefinite.

The Examiner sets forth a number of reasons for this rejection at page 3 of the Office Action.

In response, applicant has amended claim 30 to more clearly recite a two-stage heat treatment for forming the carbonized product, with each stage being at a different specific temperature range. Applicant has amended claims 28 and 29 to provide antecedent basis for terms that are employed in claim 30. Applicant has amended claim 35 as proposed by the Examiner, and has also amended claim 39 to clarify the heat treatment set forth therein.

With respect to the term “easily graphitizable carbon” in claim 33, and the term “non-graphitizable” in claims 36-38 and 40, applicant has deleted these terms from the claims. In claim 33, applicant has replaced these terms “easily graphitizable carbon” with specific materials that are disclosed in the specification. See page 9, lines 3 to 6 for the materials recited in claim

33. In claim 40, applicant has replaced the term “non-graphitizable carbon material” with specific materials that are disclosed at page 17, lines 24 to 27.

In view of the above, applicant requests withdrawal of this rejection.

Claims 28-35 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent 4,556,547 to Nishino et al.

Applicant submits that Nishino et al do not disclose or render obvious the subject matter of the present claims and, accordingly, requests withdrawal of this rejection.

Nishino et al are directed to a process for treatment of a gas containing hydrogen sulfide and/or carbonyl sulfide by contacting the gas with an activated carbon. Nishino et al disclose that incorporation into the activated carbon of a copper compound, and an alkali metal compound and/or an alkaline earth metal compound leads to highly efficient removal of hydrogen sulfide and carbonyl sulfide.

The Examiner particularly refers to the disclosure in Nishino et al at column 3, lines 31 to 38, which discloses an activated carbon that can contain an alkaline earth metal and an alkali metal.

In the present invention, as set forth in independent claims 28 and 29, the activating treatment with the alkali metal in the present invention occurs as a second step after the raw material is carbonized in the presence of the alkaline earth metal.

In contrast, in the disclosure at col. 3, lines 31 to 38 of Nishino et al, activation and carbonization occur before the alkali metal compound is added.

Thus, Nishino et al, at column 3, lines 31 to 34, describe a process which comprises “adding an alkaline earth metal compound to a raw material for activated carbon, [and] effecting carbonization/activation by a conventional method.” However, Nishino et al neither teach nor suggest the adding of an alkaline earth metal compound to a raw material and heat-treating to form a carbonized product, and then adding an alkali metal compound for activation in a separate step as taught in the present invention.

Nishino et al teach admixing to the activated carbon an alkali metal compound after carbonization/activation at column 3, lines 34 to 38. However, since Nishino et al mention at column 3, lines 34 to 38 that the process comprises “drying or calcining” the mixture of the activated carbon and an alkali metal compound, if necessary, it is apparent that the alkali metal compound is not added for the purpose of activating the material for activated carbon.

As is clear from the Nishino et al disclosure of incorporating into activated carbon an alkali metal compound and/or an alkaline earth metal compound, which leads to highly efficient removal of hydrogen sulfide and carbonyl sulfide in gases (see column 1, lines 24 to 30), the alkali metal compound and/or alkaline earth metal compound employed in the invention of Nishino et al are not used for carbonizing or activating the material for activated carbon.

Nishino et al employ in their Examples acetate salt and nitrate salt as an alkali metal compound to be admixed with the raw material for activated carbon. See Table 3 and the like. Accordingly, it is apparent to one of the ordinary skill in the art that these alkali metal compounds do not cause alkali activation.

Further, in Example 8 of Nishino et al, which discloses a step of adding an alkali metal compound and an alkaline earth metal compound to a coconut-shell raw material, carbonization

is stated by Nishino et al to be at 650°C, and activation is stated by Nishino et al to be conducted by steam activation at 900°C. Therefore, the conventional method at column 3, line 34 of Nishino et al is understood to be steam activation, and alkali activation using an alkali metal compound as taught in the present invention would not be anticipated in Nishino et al.

As can be seen from the above discussion, Nishino et al are completely silent on performing carbonization and activation in separate steps which comprise a step of adding an alkaline earth metal compound to a raw material and heat-treating to thereby effect carbonization to obtain a carbonized product, and a separate step of mixing the carbonized product with an alkali metal compound to thereby effect activation as in the present invention.

Consequently, the invention regarding claims 28 to 35 is not disclosed or suggested by Nishino et al.

The invention regarding dependent claim 30 further differs from that of Nishimura et al. Nishino et al do not disclose performing the heat treatment for carbonizing the raw material in two heat-treatment steps, with the first heat treatment being at a temperature of 400 to less than 600°C, and the second being at a temperature of 600 to 900°C.

With respect to new claims 44 and 47, which recite the step of adding powder of an alkaline earth metal compound to a raw material powder or to a melt of the raw material, Nishino et al disclose, at column 4, lines 56 to 61, that an alkaline earth metal compound in the form of a solution or suspension is mixed to the activated carbon material. Thus, Nishino et al do not disclose or suggest the recitations of claim 44 and 47.

In addition, with respect to new claims 48 and 49, Nishino et al neither describe nor suggest using potassium hydroxide or sodium hydroxide as a preferred alkali metal compound as in the present invention.

In view of the above, applicant submits that Nishino et al do not disclose or render obvious the subject matter of the present claims and, accordingly, requests withdrawal of this rejection.

Claims 28-41 have been rejected under 35 U.S.C. § 103(a) as obvious over Nishino et al in view of U.S. Patent 6094338 to Hirahara et al.

Applicant submits that Nishino et al and Hirahara et al do not disclose or render obvious the subject matter of the present claims and, accordingly, requests withdrawal of this rejection

In this rejection, with respect to claims 36-41, the Examiner relies on the description of Hirahara et al at col., 10, line 33 and col. 10, line 45 of adding a polyvinyl alcohol or phenyl resin followed by a heat treatment step as a binder for making capacitors. The Examiner argues that it would have been obvious to employ such a step in Nishino et al.

Claims 36 to 41 define a method for producing an active carbon comprising a step of coating a porous carbon layer on the active carbon layer.

On the other hand, the description of Hirahara et al on which the Examiner relies only exemplifies preferred binders used for polarizable electrodes mainly comprising active carbon, and does not teach coating a porous carbon layer on the surface of the active carbon.

Accordingly, even by combining the teachings of Nishino et al and Hirahara et al, they do not render obviousness the method for producing the active carbon set forth in the present claims.

In addition, with respect to new claims 48 and 49, Nashino et al neither describe nor suggest using potassium hydroxide or sodium hydroxide as a preferred alkali metal compound as in the present invention, Nishino et al

In view of the above, applicant submits that Nishino et al and Hirahara et al do not disclose or render obvious the subject matter of the present claims and, accordingly, requests withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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